

University of Arkansas - Fort Smith
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General Syllabus

ELEC 2243 Applied Industrial Electricity and Safety

Credit Hours: 3

Lecture Hours: 2

Laboratory Hours: 2

Prerequisite: ELEC 1263 Industrial Electricity

Effective Catalog: 2018-2019

I. Course Information

A. Catalog Description

Introduction to industrial control circuits such as multiple pushbutton, timing relays and sequence control, switching and sensing devices including flow and limit switches and Hall-effect sensors, starting and braking methods, variable speed drives, machinery installation, troubleshooting/reading of large electrical schematics and safety considerations while working with industrial electrical equipment.

B. Additional Information

The course builds on the knowledge gained in ELEC 1263 Industrial Electricity. The controlling and sensing methods used in industrial electrical equipment and important safety considerations are emphasized. Hands-on laboratories complement the course material and enable the students to comprehend the associated text.

II. Student Learning Outcomes

A. Subject Matter

Upon successful completion of this course, the student will be able to:

1. Interpret the logic of electrical schematic diagram and use that information to successfully locate faults in motor control circuits.
2. Recognize the common control and electrical symbols used in electrical schematic diagrams.
3. Accurately wire a motor speed control circuit using its schematic diagram.
4. Wire AC motors for high/low voltage operation using NEMA nameplate information.
5. Implement full-voltage and reduced voltage motor starting methods.

6. Take proper safety precautions while working with industrial equipment in general and high voltage circuits in particular.

B. University Learning Outcomes

This course enhances student abilities in the following areas:

Analytical Skills

Critical Thinking - Students will analyze and troubleshoot advanced motor control circuits. Students use their analytical skills to understand the fault symptoms and use that knowledge to accurately diagnose the faults in motor control circuits in the laboratory experiments.

Quantitative Reasoning - Students will use fundamental mathematical concepts to solve various electrical problems.

III. Major Course Topics

- A. Basic control circuits
- B. Sensing devices
- C. Starting and braking methods
- D. Variable speed drives
- E. Motor installation.
- F. Developing control circuits and troubleshooting
- G. Electrical hazards and safety considerations